Name:_____ Date:_____

Algebra 2/Trig: Geometric Series

DO NOW: (Review)

a] Solve for all values of x: $x^4 + 2x^2 - 35 = 0$

The sum of the first n terms of a geometric sequence is: $S_n = \frac{a_1(1-r^n)}{1-r}$

* S_n is also called the "nth partial sum" of a series.

Please complete each of the following using the formula for a **geometric series**.

1) Find the sum of the first 8 terms of the sequence: 2, 4, 8, 16, …

2) Find the sum of the first 7 terms of the sequence: 5, 15, 45, 135, …

3) Find the sum of the first 7 terms of the series $\frac{1}{18}-\frac{1}{6}+\frac{1}{2}-\ldots$

4) Find S_6 for the series: 0.5 + 3.5 + 24.5 + 171.5 + …

5)Evaluate using the formula for a geometric series: $\sum_{k=1}^{5} 3^k$

6) Evaluate using the formula for a geometric series: $\sum_{k=1}^{7} 4(0.5)^k$

7) Sammi Jacknis watches Full House 3 times on day 1, then 6 times on day 2, then 12 times on day 3, and so on. How many times will she have watched the movie **in total** at the end of day 15?

8) Use sigma notation to represent each sum:

a] $3 + 6 + 9 + 12 + \ldots$ for the first 33 terms

b] $-3 + 6 - 12 + 24 + \ldots$ for the first 50 terms

c] $6 + 2 + 2/3 + 2/9 + \ldots$ for the first n terms

For each problem, you **must use the formula for a geometric series** to receive credit!

9) Find the sum of the first 8 terms of the sequence: 4, 12, 36, …

10) Find the sum of the first 9 terms of the sequence: 2, 10, 50, …

11) Find the sum of the first 8 terms of the sequence: 3, -6, 12, -24, …

12) Find S_7 for the series: 3 + 12 + 48 + … (This is asking you to do the same thing as in # 9 – 11)

13) Find S_{10} for the following series: -2 + -4 + -8 + …

14) Find S_8 for the series: .5 -.25 + .125 - …

15) Find S_6 for the following series: $1 + ½ + ¼ + \ldots$

16) Re-write using the formula for a geometric series: $\sum_{k=1}^{n} 6(0.5)^k$

17) When it first began, *Facebook* © gained 6 members the first day, 18 members the second day, 54 members the third day, and so on. How many TOTAL members did *Facebook* © have after 11 days?